


FEMCard analysis result

11.12.15


Project data	
Projectname	Hill_small_strain
Folder	F:\X_tmp_del\Demo_Projects\B_transversely_isotropic\A_quasi_static\small_strain
Created at	08.06.2015
Maker	Parsolve GmbH
Comment	Synthetic measurement data
Material model	TRANSV_ISOTR SMALL strain transv. isotr. HILL (Rij) PLASTICITY (nonl. isotr. hardg.), rotat. syn

Test informations


Test 1

Color	
Number	1
Name	Zugv_Entlastung_s_xx_e_xx_e_yy
Folder	F:\A_synth_meas\B_transversely_isotropic\A_quasi_static\small_strain\meas_data\Zugv_Entlastung_s_xx_e_xx_e_yy.t
Load type	Anisotropic static SMALL strain UNIAXIAL X stress vs. X and Y strains
Weight T	1.61377

Test 2

Color	
Number	2
Name	Zugv_s_yy_e_yy_e_zz
Folder	F:\A_synth_meas\B_transversely_isotropic\A_quasi_static\small_strain\meas_data\Zugv_s_yy_e_yy_e_zz.t
Load type	Anisotropic static SMALL strain UNIAXIAL Y stress vs. Y and Z strains
Weight T	1

Test 3

Color	
Number	3
Name	Schubv_s_xy_g_xy
Folder	F:\A_synth_meas\B_transversely_isotropic\A_quasi_static\small_strain\meas_data\Schubv_s_xy_g_xy.txt
Load type	Anisotropic static SMALL strain SHEAR X_Y stress vs. X_Y engineering shear strain
Weight T	1.94505

Tests weight TR

Test 1		
Start	End	Value
0	25	1.2e+03
26	50	399

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51	125	58.5
126	200	14.1
201	250	9.08
251	450	1

Test 2		
Start	End	Value
0	49	189
50	99	57.5
100	150	10.9
151	200	3.76
201	250	1.7
251	300	1

Test 3		
Start	End	Value
0	49	138
50	99	41.5
100	150	7.3
151	200	3.18
201	250	1.77
251	300	1

Tests weight SD

Test 1	
Strain direction	Value
ε_{exp}^{xx}	1
ε_{exp}^{yy}	2.1

Test 2	
Strain direction	Value
ε_{exp}^{zz}	1.55
ε_{exp}^{yy}	1

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Model parameter					
Parameter	Fix	Lower limit	Upper limit	Start value	Result
E_x		1000	300000	120000	121438.1
E_y=E_z		1000	300000	100000	98630.51
nu_xy		-0.2	0.6	0.4	0.3935076
nu_yz		-0.1	0.5	0.3	0.2990692
G_xy		800	300000	30000	29491
R_xx	x	1	1	1	1
R_yy		0.2	2	1	0.79988
R_xy		0.2	2	1	0.7007853
Y_0		20	200	60	70.84252
Y_inf		30	300	90	110.2211
Omega		50	800	130	201.1088
H		10	10000	1000	390.3702

Processing parameter	
Max. number of steps	200
LM start value	1
Max. error sum of squares	0.001

Processing results	
Steps	5
Least squares sum	6.52819e-05

Correlation matrix												
	E_x	E_y=E_z	nu_xy	nu_yz	G_xy	R_xx	R_yy	R_xy	Y_0	Y_inf	Omega	H
E_x	1	0.275	0.324	-0.161	0.395	0	0.268	0.278	-0.451	-0.212	-0.0779	0.0244
E_y=E_z	0.275	1	-0.066	-0.205	0.29	0	-0.391	0.15	-0.238	-0.0711	-0.164	0.0312
nu_xy	0.324	-0.066	1	0.0387	-0.0947	0	-0.0644	-0.0668	0.108	0.0509	0.0187	-0.00586
nu_yz	-0.161	-0.205	0.0387	1	-0.203	0	0.36	-0.0644	0.148	0.0027	0.132	0.00428
G_xy	0.395	0.29	-0.0947	-0.203	1	0	-0.0582	-0.373	-0.537	0.0708	-0.121	-0.148
R_xx	0	0	0	0	0	1	0	0	0	0	0	0
R_yy	0.268	-0.391	-0.0644	0.36	-0.0582	0	1	0.398	-0.144	-0.483	0.227	0.269
R_xy	0.278	0.15	-0.0668	-0.0644	-0.373	0	0.398	1	0.104	-0.443	-0.164	0.315
Y_0	-0.451	-0.238	0.108	0.148	-0.537	0	-0.144	0.104	1	0.388	-0.53	-0.273
Y_inf	-0.212	-0.0711	0.0509	0.0027	0.0708	0	-0.483	-0.443	0.388	1	-0.652	-0.935
Omega	-0.0779	-0.164	0.0187	0.132	-0.121	0	0.227	-0.164	-0.53	-0.652	1	0.659

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H	0.0244	0.0312	-0.00586	0.00428	-0.148	0	0.269	0.315	-0.273	-0.935	0.659	1
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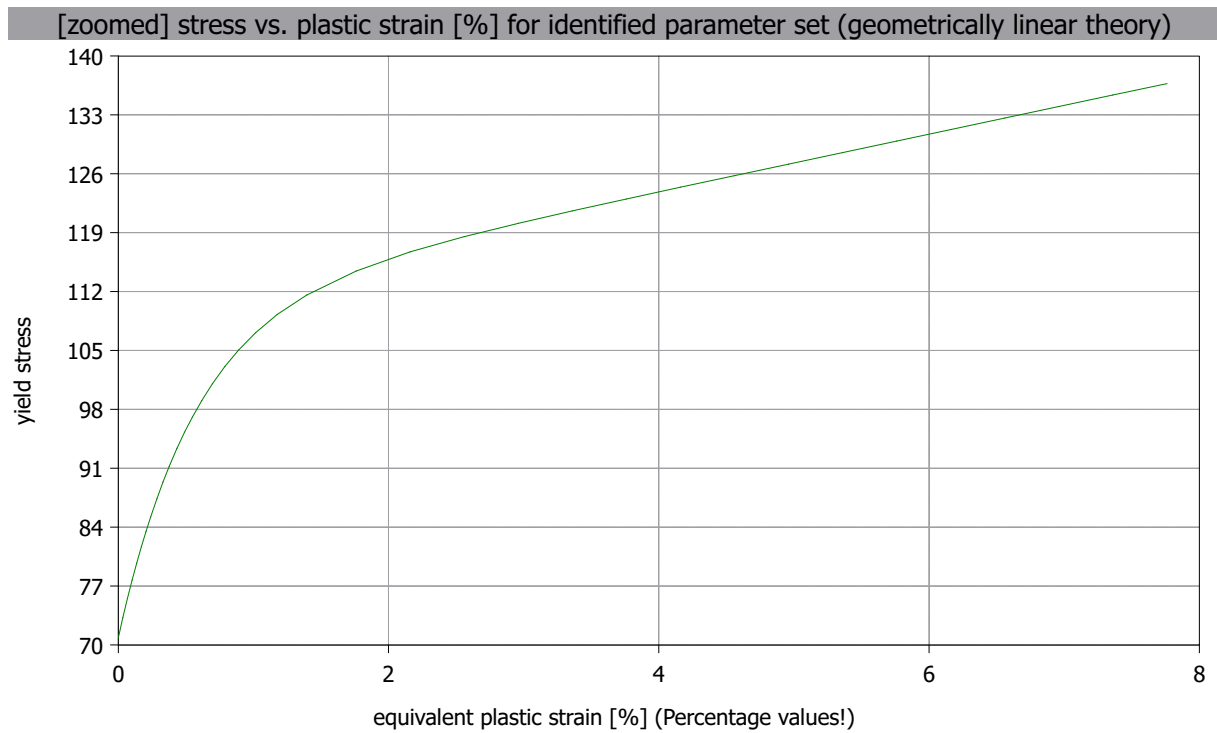
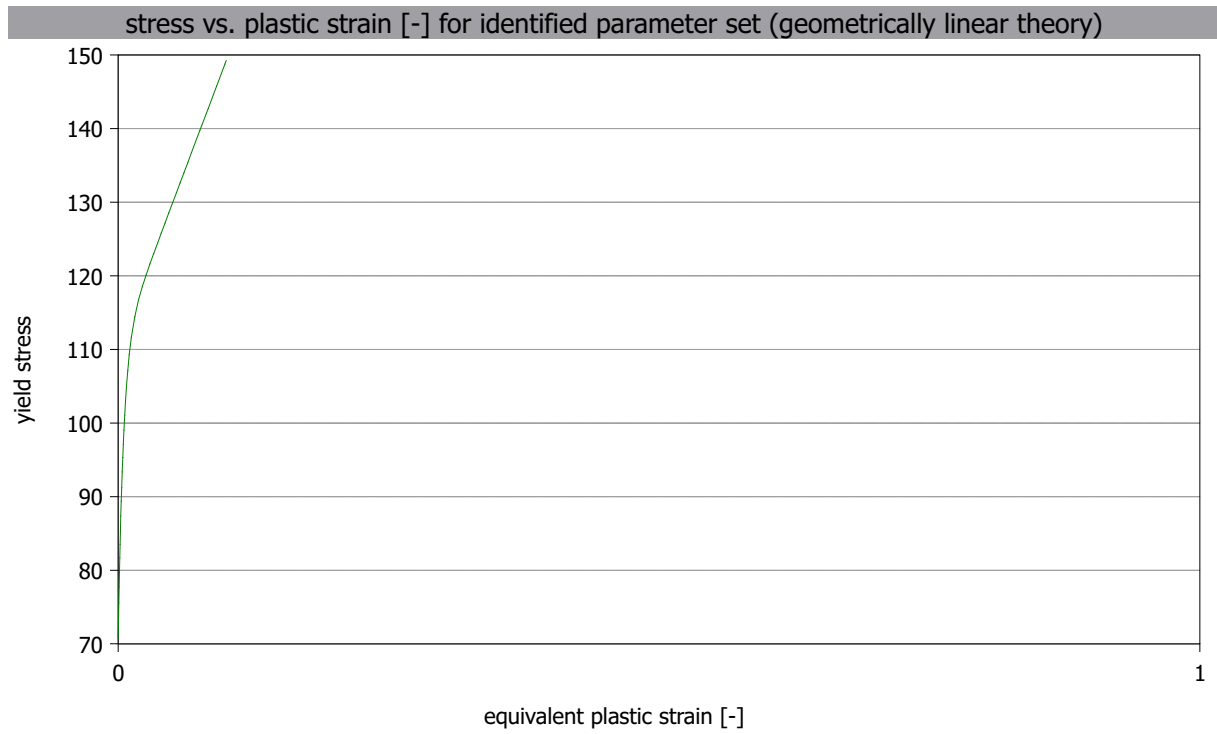
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stress vs. plastic strain [-] for identified parameter set (geometrically linear theory)	
yield stress	equivalent plastic strain [-]
70.84252	0
73.26519	0.0003
75.55288	0.0006
77.71348	0.0009
79.75444	0.0012
81.68275	0.0015
83.50503	0.0018
85.22747	0.0021
87.37881	0.0025
89.37593	0.0029
91.23077	0.0033
93.36588	0.0038
95.3154	0.0043
97.09711	0.0048
99.03611	0.0054
101.0549	0.0061
103.0833	0.0069
105.0623	0.0078
107.1198	0.0089
109.2799	0.0103
111.5974	0.0122
114.4536	0.0154
116.719	0.0189
118.53	0.0224
120.1163	0.0259
121.5914	0.0294
123.0115	0.0329
124.4045	0.0364
125.7839	0.0399
127.1567	0.0434
128.5263	0.0469
129.8941	0.0504
131.2612	0.0539
132.6279	0.0574
133.9944	0.0609

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135.3608	0.0644
136.7271	0.0679
139.733	0.0756
142.7389	0.0833
145.7447	0.091
148.7506	0.0987
149.219	0.0999

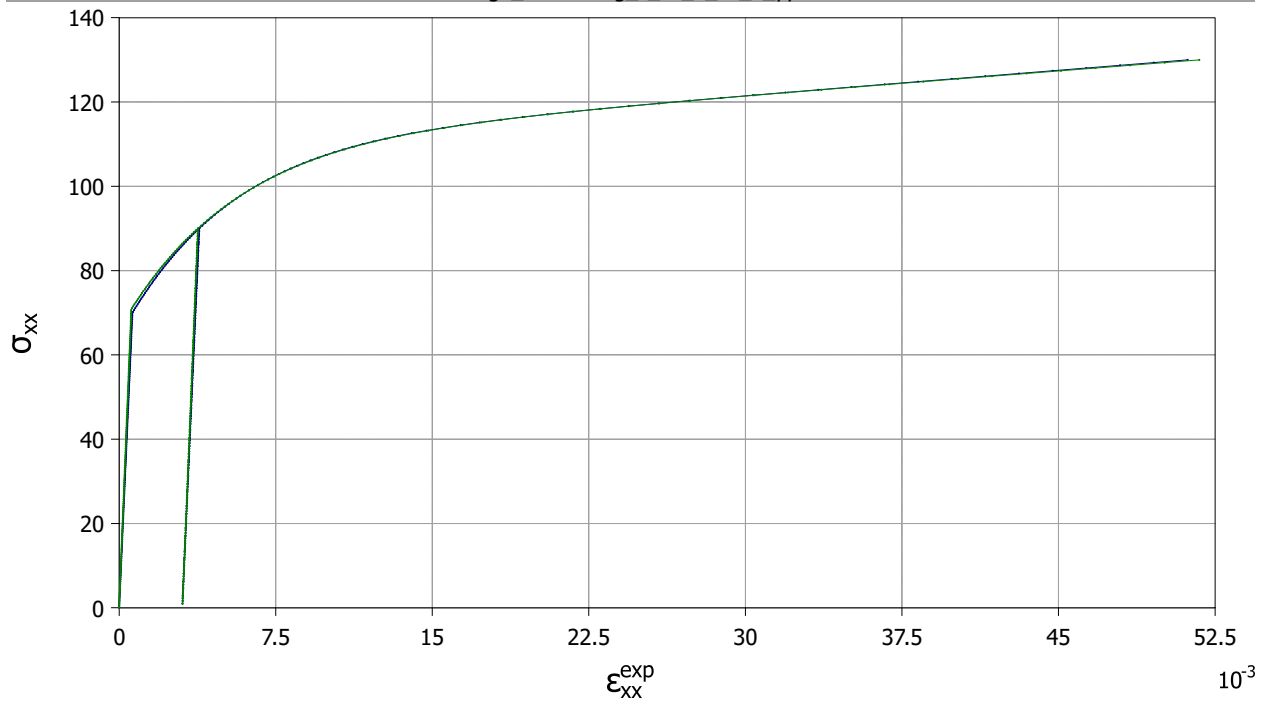


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Verification

Zugv_Entlastung_s_xx_e_xx_e_yy



Zugv_Entlastung_s_xx_e_xx_e_yy

